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Intelligent Knowledge Database (IKD) Tool for Formal Methods

Manju Nanda J.Jayanthi and Madhan.V

National Aerospace Laboratories, Bangalore, India

ABSTRACT

This paper discusses the Intelligent Knowledge Database (IKD) tool generated for formal methods. The knowledge database provides the information regarding the existing formal methods in the area of academia, industry and R&D sectors. The tool provides complete information about the formal methods adopted in the conventional or model-based approach, in the various phases of the software development life cycle process, list of tools using formal techniques with their version and published literature supporting formal methods. This knowledge-database serves as a live encyclopedia which will enable the engineers and researchers interested in the field of formal methods. The database is intelligent because it provides the user with the flexibility of searching the formal method related information using keyword similar to the search engine. This is a unique tool for formal methods encompassing most of the published literature with intelligent search options.

KEYWORDS

Formal methods, Information retrieval, Verification and Validation, SDLC Phases, Encyclopedia, Database, Live database tool.

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TECHRISK - A DECISIONAL FRAMEWORK TO MEASURE TECHNICAL DIMENSIONS OF LEGACY APPLICATION FOR REJUVENATION THROUGH REENGINEERING

Anand Rajavat¹ and Vrinda Tokekar²

¹Shri Vaishnav Institute of Technology and Science, India

²Institute of Engineering and Technology (DAVV), India

ABSTRACT

Competitive business environment wants to modernize existing legacy system in to self-adaptive ones. A variety of options are available to renovate legacy system in to more contemporary system. Recently the phenomenon of “software reengineering “, a methodology to allow old ways of thinking to be replaced with new, fresh approaches to increase productivity and quality of system, has been reported. However evolving legacy system through reengineering is a risky and error – prone task due to extensive changes it requires in the majority of cases. Therefore cost effective reengineering requires identifying and measuring impact of system, managerial and technical risk. We present a technical domain framework TechRisk to identify and measure quality and functional dimensions of legacy system. The objective is to identify those risk factors of technical domain which are critical to the success of reengineering. Proposed decision driven framework TechRisk provide support to identify and eliminate the highest impact risks in the software reengineering process and help to create a successful reengineering solution.

KEYWORDS

TechRisk, Reengineering, Risk engineering, Legacy system, Software quality, Domain

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INTEGRATING SOFTWARE REPOSITORY MINING: A DECISION SUPPORT CENTERED APPROACH

Luiz Dourado Dias Junior and Eloi Favero
Department of Electric Engineering, UFPA, Belem, PA

ABSTRACT

Mining software repositories (MSR) research had significantly contributed to software engineering. However, MSR results integration across repositories is a recent concern that is getting more attention from researchers each day. Some noticeable research in this sense is related to the approximation between MSR and semantic web, specially linked data approaches which makes it possible to integrate repositories and mined results. Manifested that way, we believe that current research is not fully addressing the practical integration of MSR results, specially, in software engineering due to not considering that these results needs to be integrated to the tools as assistance to activity performers, as a kind of decision making support. Based on this statement this research describes an approach, named Sambasore, which is concerned with MSR results inter-repository ntegration and also to decision making support processes, based on tool assistance modelling. To show its feasibility we describe the main concepts, some related works and also a proof of concept experiment applied to a software process modelling tool named Spider PM.

KEYWORDS

Network Protocols, Wireless Network, Mobile Network, Virus, Worms & Trojon

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EA-MDA Model to Resolve is Characteristic Problems in Educational Institutions

Mardiana¹ and Keijiro Araki²

^{1,2}Dept. of Advanced Information Technology, Kyushu University, Fukuoka, Japan

¹Dept. of Electrical Engineering, University of Lampung, Indonesia

ABSTRACT

Higher education institutions require a proper standard and model that can be implemented to enhance alignment between business strategy and existing information technologies. Developing the required model is a complex task. A combination of the EA, MDA and SOA concepts can be one of the solutions to overcome the complexity of building a specific information technology architecture for higher education institutions. EA allows for a comprehensive understanding of the institution's main business process while defining the information system that will assist in optimizing the business process. EA essentially focuses on strategy and integration. MDA relies on models as its main element and places focuses on efficiency and quality. SOA on the other hand uses services as its principal element and focuses on flexibility and reuse. This paper seeks to formulate an information technology architecture that can provide clear guidelines on inputs and outputs for EA development activities within a given higher education institution. This proposed model specifically emphasises on WIS development in order to ensure that WIS in higher education institutions has a coherent planning, implementation and control process in place consistent with the enterprise's business strategy. The model will then be applied to support WIS development and implementation at University of Lampung (Unila) as the case study

KEYWORDS

Enterprise Architecture, Web Information system, Higher Education, MDA, SOA

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AUTHORS

Mardiana She received B.S. degree in Electrical Engineering at the National Institute of Technology, Indonesia and the M.S degree in Electrical Engineering at the Bandung Institute of Technology, Indonesia, in 1997 and 2002 respectively. Since 1998 until now, she is working as a lecturer at Department of Electrical Engineering, University of Lampung, Indonesia. She is currently a PhD student in Graduate School of Information Science and Electrical Engineering, Department of Advanced Information Technology, Kyushu University, Japan.



Keijiro Araki He received his B.S., M.E. and D.E. degree in Computer Science and Communication Engineering from Kyushu University, Japan, in 1976, 1978 and 1982 respectively. Since 1984 till 1993 he was an Associate Professor in the same department. From 1993 to 1996 he was working as a Professor at the Graduate School of Information Science, Nara Institute of Science and Technology, Japan. Now, he is a Professor at the Graduate School of Information Science and Electrical Engineering in Kyushu University since 1996.



A METHODOLOGY TO EVALUATE OBJECT ORIENTED SOFTWARE SYSTEMS USING CHANGE REQUIREMENT TRACEABILITY BASED ON IMPACT ANALYSIS

Sunil T. D. and M. Z. Kurian
Sri Siddhartha Institute of Technology, India

ABSTRACT

It is a well known fact that software maintenance plays a major role and finds importance in software development life cycle. As object-oriented programming has become the standard, it is very important to understand the problems of maintaining object-oriented software systems. This paper aims at evaluating object-oriented software system through change requirement traceability – based impact analysis methodology for non functional requirements using functional requirements. The major issues have been related to change impact algorithms and inheritance of functionality.

KEYWORDS

Change Requirement Traceability, Impact Analysis, Object-Oriented Software Systems, Software Maintenance, Change Impact algorithms, inheritance of functionality.

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AUTHORS

Asst. Prof. **Sunil T D** received Bachelor Degree from Bangalore University in Electronics and Post graduate degree in Electronics from Visvesvaraya Technological University at BMSCE, Bangalore and Pursuing Ph.D degree in Software Engineering from VTU, Belgaum, Karnataka, India. Having 12 Years of Teaching experience in the field of Electronics & Communication Engineering. Published several papers in peer reviewed international journals, and several conference papers.



Dr **M.Z.Kurian** received his Bachelor Degree from Bangalore University and Post graduate degree in Industrial Electronics from Mysore University, and Ph.D degree in Software Engineering from Dr.MGR University, Chennai, Tamil Nadu, India. He has more than 30 Years of Teaching experience in the field of Electronics & Communication Engineering. Published several papers in peer reviewed international journals including IEEE, and several conference papers.



A Literature Survey of Cognitive Complexity Metrics for Statechart Diagrams

Ann Wambui King'ori^{1,2}, Geoffrey Muchiri Muketha¹ and Elyjoy Muthoni Micheni³

¹Murang' a University of Technology, Kenya

²Nkabune Technical Training Institute, Kenya

³The Technical University of Kenya, Kenya

ABSTRACT

Statechart diagrams have inherent complexity which keeps increasing every time the diagrams are modified. This complexity poses problems in comprehending statechart diagrams. The study of cognitive complexity has over the years provided valuable information for the design of improved software systems. Researchers have proposed numerous metrics that have been used to measure and therefore control the complexity of software. However, there is inadequate literature related to cognitive complexity metrics that can apply to measure statechart diagrams. In this study, a literature survey of statechart diagrams is conducted to investigate if there are any gaps in the literature. Initially, a description of UML and statechart diagrams is presented, followed by the complexities associated with statechart diagrams and finally an analysis of existing cognitive complexity metrics and metrics related to statechart diagrams. Findings indicate that metrics that employ cognitive weights to measure statechart diagrams are lacking.

KEYWORDS

UML, Statechart diagrams, Software metrics, Cognitive complexity metrics, statechart complexity metrics

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AUTHORS

Ann Wambui King’ori is an ICT Assistant Lecturer at the Department of Information Communication Technology at Nkabune Technical Training Institute, Kenya. She earned her Bachelor of Technology Education (Computer Studies) from the University of Eldoret, Kenya in 2014. She is currently pursuing her MSc. in Information Technology at Murang’a University of Technology, Kenya. Her research interests include software metrics, software quality, and business intelligence.



Geoffrey Muchiri Muketha is an Associate Professor and Dean of the School of Computing and Information Technology, Murang'a University of Technology, Kenya. He received his BSc. in Information Science from Moi University in 1995, his MSc. in Computer Science from Periyar University, India in 2004, and his Ph.D. in Software Engineering from Universiti Putra Malaysia in 2011. He has wide experience in teaching and supervision of postgraduate students. His research interests include software and business process metrics, software quality, verification and validation, empirical methods in software engineering, and component-based software engineering. He is a member of the International Association of Engineers (IAENG).



Elyjoy Muthoni Micheni is a Senior Lecturer in Information Systems in the Department of Management Science and Technology at The Technical University of Kenya. She holds a Ph.D. (Information Technology) from Masinde Muliro University of Science and Technology, Master of Science (Computer Based Information Systems) from Sunderland University, (UK); achelor of Education from Kenyatta University; Post Graduate Diploma in Project Management from Kenya Institute of Management. She has taught Management Information System courses for many years at the University level. She has presented papers in scientific conferences and has many publications in refereed journals. She has also co-authored a book for Middle-level colleges entitled: “Computerized Document Processing”. Her career objective is to tap computer-based knowledge as a tool to advance business activities, promote research in ICT and enhance quality service.



LEAN THINKING IN SOFTWARE ENGINEERING : A SYSTEMATIC REVIEW

Fernando Sambinelli¹ and Marcos Augusto Francisco Borges²

¹Federal Institute of Education, Science and Technology of São Paulo, Hortolândia,
Brazil

²School of Technology, University of Campinas, Limeira, Brazil

ABSTRACT

The field of Software Engineering has suffered considerable transformation in the last decades due to the influence of the philosophy of Lean Thinking. The purpose of this systematic review is to identify practices and approaches proposed by researchers in this area in the last 5 years, who have worked under the influence of this thinking. The search strategy brought together 549 studies, 80 of which were classified as relevant for synthesis in this review. Seventeen tools of Lean Thinking adapted to Software Engineering were catalogued, as well as 35 practices created for the development of software that has been influenced by this philosophy. The study provides a roadmap of results with the current state of the art and the identification of gaps pointing to opportunities for further research.

KEYWORDS

Lean Thinking, Lean IT, Agile, Software Engineering, Software Development, Systematic Review

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CONTEXT AWARE CLUSTERING USING GLOVE AND K-MEANS

Pulkit Juneja, Hemant Jain, Tanay Deshmukh, Siddhant Somani, B.K. Tripathy,
Senior Member, IEEE, School of Computer Science and Engineering, VIT University,
Vellore, Tamil Nadu, India

ABSTRACT

In this paper we propose a novel method to cluster categorical data while retaining their context. Typically, clustering is performed on numerical data. However it is often useful to cluster categorical data as well, especially when dealing with data in real-world contexts. Several methods exist which can cluster categorical data, but our approach is unique in that we use recent text-processing and machine learning advancements like GloVe and t-SNE to develop a context-aware clustering approach (using pre-trained word embeddings). We encode words or categorical data into numerical, context-aware, vectors that we use to cluster the data points using common clustering algorithms like K-means.

KEYWORDS

Natural language processing, context-aware clustering, k-means, word embeddings, GloVe, t-SNE

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AUTHORS

Pulkit Juneja – B.Tech. Computer Science and Engineering, Vellore Institute of Technology, Vellore, India (2017 Batch) Currently working at McKinsey and Co.



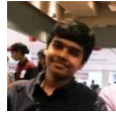
Hemant Jain – B.Tech. Computer Science and Engineering, Vellore Institute of Technology, Vellore, India (2017 Batch) Joining University of Washington, MS in Data Science (2017-19)



Tanay Deshmukh – B.Tech. Computer Science and Engineering, Vellore Institute of Technology, Vellore, India (2017 Batch) Joining University of Southern California, MS in Computer Science conc. in Data Science (2017-19)



Siddhant Somani – B.Tech. Computer Science and Engineering, Vellore Institute of Technology, Vellore, India (2017 Batch) Joining Columbia University, MS in Computer Science (2017-19)



B. K. Tripathy – Senior Professor, School of Computer Science and Engineering, Vellore Institute of Technology, Vellore, India Areas of practice – Machine Learning, Data Mining, Artificial Intelligence, Clustering, Fuzzy Sets



A NOVEL EFFORT ESTIMATION MODEL FOR SOFTWARE REQUIREMENT CHANGES DURING SOFTWARE DEVELOPMENT PHASE

Jalal Shah, Nazri Kama and Nur Azaliah A Bakar
Department of Razak Faculty of Technology and Informatics, Universiti Teknologi
Malaysia, Kuala Lumpur, Malaysia

ABSTRACT

Software Requirements Changes is a typical phenomenon in any software development project. Restricting incoming changes might cause user dissatisfaction and allowing too many changes might cause delay in project delivery. Moreover, the acceptance or rejection of the change requests become challenging for software project managers when these changes are occurred in Software Development Phase. Where in Software Development Phase software artifacts are not in consistent state such as: some of the class artifacts are Fully Developed, some are Half Developed, some are Major Developed, some are Minor Developed and some are Not Developed yet. However, software effort estimation and change impact analysis are the two most common techniques which might help software project managers in accepting or rejecting change requests during Software Development Phase. The aim of this research is to develop a new software change effort estimation model which helps software project manager in estimating the effort for software Requirement Changes during Software Development Phase. Thus, this research has analyzed the existing effort estimation models and change impact analysis techniques for Software Development Phase from the literature and proposed a new software change effort estimation model by combining change impact analysis technique with effort estimation model. Later, the new proposed model has been evaluated by selecting four small size software projects as case selections in applying experimental approach. The experiment results show that the overall Mean Magnitude Relative Error value produced by the new proposed model is under 25%. Hence it is concluded that the new proposed model is applicable in estimating the amount of effort for requirement changes during SDP.

KEYWORDS

Software Change Effort Estimation, Software Requirement Changes, Function Point Analysis, Constructive Cost Model and Software Development Phase.

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AUTHORS

Jalal Shah, he is pursuing PhD in the field of Software Engineering from Universiti Teknologi Malaysia. He has more than 8 year of teaching & research experience. He is currently working in the area of Software Effort Estimation. He has also published & presented papers in refereed journals and conferences.



Nazri Kama, He is an Associate Professor at Universiti Teknologi Malaysia (UTM) specializing in software engineering. He graduated in Bachelor in Management Information System from Universiti Teknologi Malaysia. Later, he obtained a Master Degree from the same university in Real-time Software Engineering. In 2011, he received a Doctorate in Software Engineering from the University of Western Australia in Australia



Nur Azaliah Abu Bakar, PhD is a Senior Lecturer at Advanced Informatics Department, Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia. She graduated with a Bachelor (Information Technology) in Information Systems Engineering from Multimedia University (MMU) Malaysia (2000). She then obtained her Masters in Information Technology from Universiti Teknologi Mara (UiTM) in 2004. In 2017 she was awarded a Doctor of Philosophy degree in Information Technology (Enterprise Architecture) by Universiti Teknologi Malaysia



INVESTIGATING GAME DEVELOPERS' GUILT EMOTIONS USING SENTIMENT ANALYSIS

Lamiaa Mostafa and MarwaAbd Elghany

Department of Business Information Systems, College of Management and Technology,
Arab Academy for Science & Technology, Alexandria, Egypt

ABSTRACT

Game Development is one of the most important emerging fields in software engineering era. Game addiction is the nowadays disease which is combined with playing computer and videogames. Shame is a negative feeling about self evaluationas well as guilt that is considered as a negative evaluation of the transgressing behaviour, both are associated withadaptive and concealing responses. Sentiment analysis demonstrates a huge progression towards the understanding of web users' opinions. In this paper, the sentiments of game developers are examined to measure their guilt's emotions when working in this career. The sentiment analysis model is implementedthrough the following steps: sentiment collector, sentiment pre-processing, and then machine learning methods were used. The model classifies sentiments into guilt or no guilt and is trained with 1000 Reddit website sentiment. Results have shown that Support Vector Machine (SVM) approach is more accurate incomparison to Naïve Bayes (NV) and Decision Tree.

KEYWORDS

Ethics, Game Addiction, Guilt Emotions, Software Engineering, Sentiment Analysis Model& Value Sensitive Design

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